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ABSTRACT

The first of two papers describes the author's experiences teaching a narrow-cast instructional development course at Indiana University. Among the disadvantages of the experience were the logistics of coordinating the instructional activities between two campuses, additional preparation time requirements, diminished student-teacher interactions, and negative learner attitudes. Advantages included smoother, more effective class sessions; more effective text and graphic visuals; decreased cost; increased course offerings; a more diverse group of learners; and the opportunity to demonstrate the use of alternative instructional delivery strategies to novice instructional developers. The second paper describes a study which compared the performance and attitudes toward instruction of 60 eighth-grade students who worked either individually or in two-member teams on a computer-assisted sex education lesson. It was found that learners working together significantly out-performed those working alone, but no significant differences were observed on the attitude toward instruction measure. Mean percent scores for the verbal information and visual recall posttests and for the attitude survey are appended, and three references are provided. (Author/MES)

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Title:

Some Advantages and Disadvantages of Narrow-Cast Instructional Television: One Instructor's Experience

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Some Advantages and Disadvantages of Narrow-Cast Instructional Television: One Instructor's Experience

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Abstract

This presentation describes the author's experiences in teaching a narrow-cast instructional development course. Among the disadvantages of the experience were the logistics of coordinating the instructional activities between two campuses, additional preparation time requirments, diminishedstudent-teacherinteractions, and negative learner attitudes. Advantages included smoother, more effective class sessions, more effective text and graphic visuals, decreased cost and increased course offerings, a more diverse group of learners, and the opportunity to demonstrate the use of alternative instructional delivery strategies to novice instructional developers.

Introduction

During my second semester at Indiana University, I was approached by my department chair and asked if I would like to narrow-cast the sessions of my introductory Instructional Development course to the "core campus" of IU. Here, the "core campus" can mean many things, depending on how and when the concept is applied. Generally, the core campuses of Indiana University include Indiana University Purdue University Indianapolis (IUPUI) and the Bloomington campus.

At Bloomington, the Instructional Systems Technology department has made a commitment to teaching various programs on the IUPUI campus, but due to factors including commute time and distance and the lack of qualified instructors in Indianapolis, we often have difficulty in meeting those commitments. In short, the Bloomington faculty can not be in two places at one time.

Enter the Indiana Higher Education Television System or IHETS. IHETS is a narrow-cast instructional television system that allows us to be in several places at once through the magic of television. On the Bloomington campus, instructional television programming is accomplished through the Radio and Television department, and cable-cast to the receiving classrooms at other campuses.

My first reaction to such a proposition was admitedly a bit egocentric. I felt as if I had suddenly been made a "star." So, despite some warnings from a colleague who had been televising such courses in the past, I agreed and plunged headlong into awaiting fame.

Some Disadvantages

First, the bad news. Needless to say, my naivté shone through almost immediately. My first task was to tour the studio where the taping was to occur. To this day, I must say that I am still somewhat awed by television technology. The studio used for this type of ITV course is shared by WTIU, the local public television station. Although not grand praise, these facilities are among the finest of their kind in the State.

The lights, cameras, and action abounding before me convinced me that I was indeed going to be a "star." My director, John Winninger, struggled hard to convince me that it really was not that big a deal, but never the less, I was awestruck. Together, we decided that we would narrow-cast li o that the audience at IUPUI could sk any questions as they arose. We also decided to include the entire Bloomington class as the studio audience and placed them on a lighted stage.

The first major disadvantge that we encountered seems, in hindsight, to be somewhat obvious. From the first night the studio lights and the TV appartus seemed to stiffle the questions of most the students in the "live" audience. They seemed to feel as if their questions would make the production suffer. Despite many attempts, it was exceedingly difficult to sustain class discussions or encourage questionning. To rectify this situation, we moved the audience off-stage, and placed microphones overhead to pick-up their questions. This change not only improved the amounts of discussion, but also improved my ability to engage in meaningful eye contact with the studio group. However, the frequency of questions still was far less than a "conventional" classroom environment and I noted an overall dimished sense of rapport with the studio group as the result.

On the subject of questions: because of budget constraints, the direct telecommunications link with the IUPUI audience was removed. Instead, they had to pick-up a device similiar to a standard telephone which would actually place what amounted to a long-distance phone call for each question. Unfortuanetly, this calling mechanism required eight seconds to accomplish. Now, eight seconds may not seem like a great deal of time, but it always seemed to be a "just missed" situation. I'd call for questions and wait one or two seconds too few, or they would call and catch me as I began a new topic, one or two seconds too late.

Of course there were minor inconveniences encountered all the time. For example, the need to dress and adopt a general demeanor that was more formal than my usual style was a bit of a nuisance at first, as was wearing the microphone and earpiece.

But the major problems surrounding this experience related to handling the logistics with the IUPUI group. Despite assurances to the contrary, there was never a reliable contact person in Indianapolis that would handle such seemingly trivial matters as proctoring and collecting exams, distributing class materials, collecting assignments, etc. For example, when it came time for the final exam, there was simply no one willing to pass-out or proctor the exam and the students sat for two hours waiting for someone to show-up with an explanation for why their study time had been so ill-spent.

One additional problem that caused difficulty throughout the semester was a calendar conflict. The official IUPUI semester began and ended 10 days before that of the Bloomington campus and the spring recess for the two campuses fell during different weeks. The result was a condensing of the number of sessions and an occasional tape-delay for one or more of the audiences.

Some Advantages of ITV

Now for the good news. In many ways, this ITV experience proved beneficial personally and professionally. Although I've been teaching for many years, I've never been forced to prepare as carefully and thoughtfully as when the course was televised. Although my first reaction to the amount of planning required was that it would constrain my creativity and stiffle the spontaneity, not to mention detract from my other commitments, I found that the opposite was often the case. The more I carefully planned the presentations, the more comfortable I became in digressing and enlivening the material. By knowing what was to come next, I was able to relax and not worry about filling time or "flying by the seat of my pants."

From the ID perspective, this experience once again demonstrated the utility of carefully designed and developed instruction. I not only felt more comfortable with the content, but I also felt more effective as an instructor.

There were also advantages from a message design perspective. Instead

of displaying transparencies or simply "talking through" important points, I was able to use computer-generated text to highlight important points, show the learners examples, display the lesson outline, etc. In addition, the visuals I developed were displayed with a close-up camera and a "chroma key" that allowed me to "zoom in" on each individual section of the graphic and drop back for a more hollistic look. The manipulations of text and visual material were far more sophisticated than what I was ordinarily capable of accomplishing with a simple overhead projector or chalkboard.

Another notable advantage of this system was related to the taping itself. At the conclusion of each show, I received a standard VHS-format cassette which I could then check-out to students who had either missed the class session or who needed additional review. As a footnote, in this particular class, approximately 50 percent of the learners are not native English language speakers and there is a significant range in their respective language abilities. These tapes provided many of these students with a review opportunity not usually possible. However, there were lingering delivery problems, principally due to the lack of public access viewing stations, that prevented this system from being used to its fullest.

Another advantage related to the video equipment was the capability of taping sessions ahead of time. On one occasion, I needed to attend a conference during the time when the class was held. Here, I simply arranged to tape the session a week earlier and narrow-cast it during the regularly scheduled time slot.

Of course there were larger benefits than the technological miracles offered by the video equipment *per se*. First, the course experience was somewhat enriched through the addition of the IUPUI group. These learners were represenative of a population of learners that are generally somewhat older and more focused in their motives than the Bloomington audience. Yet, the Bloomington crowd represents a very diverse and culturally heterogeneous mixture of learners. The two populations seem to compliment each other well.

The benefits to the University seem somewhat obvious. Because an instructor can be several places at once, the costs, especially those incurred by the remote campuses, are low, limited almost entirely to very small administrative costs. In addition, the learners on the remote campuses benefit from courses that, because of small enrollments, high costs, or lack of qualified faculty, would otherwise not be offered. Because of these factors, the attitudes of the IUPUI learners was exteremely positive, despite many logistical problems.

Finally, the most salient advantage from my perspective was the opportunity to "practice what we preach" to a greater extent. As an instructional developer, it was far more credible for me to offer such a course through a more deliberate, mediated approach than the conventional classroom. This is not to say that this course was necessarily representative of the optimal ID environment; certainly, it was not. However, in a larger sense, the learners in this course were exposed to some media and design options that they would ordinarily not see.

The Balance Sheet

Would I do it again? Probably. However, the most frustrating problem and the reason why I may be much less eager to undertake the instructional television experience again in the future is the attitude displayed by the local group. With few exceptions, these learners responded with the attitude that this technology, no matter how beneficial it may be to learning here and throughout the system, somehow cheated them out of the best possible learning environment because of its "staged" nature. Instead of being willing to experiment with a new type of learning situation, many seemed to feel compelled to demand the security

and comfort of the conventional classroom.

Among all the lessons that I learned from this experience, one far out-shone the others in my own understanding of the field of instructional development: we as professionals must advocate strongly for pedagogical change, or instructional interventions, no matter how ultimately beneficial we may believe they are, will continued to be viewed merely as new "teaching toys;" here for today, but gone tommorrow. In short, before we can indeed practice what we preach, we must actively sell the better mousetrap.

The Effects of Individual and Team Learning on Performance During Computer-Assisted Instruction

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Abstract

There is considerable evidence to suggest that CAI is an effective instructional delivery system in many situations. However, the manner in which learners interact with each other is often overlooked in CAI research and in the devlopment of CAI lessons. This study compared the performance and attitudes towards instruction of learners working individually with learners working in two-member teams on a sex education CAI lesson. On two measures of outcome performance, learners working together significantly outscored those working individually. However, there were no significant differences observed on the attitude towards instruction measure.

Background

In the past decade, research has shown that computer-based instructional programs have been effective in improving learner performance and attitudes towards instruction.

For example, Kulik, Bangert, and Williams (1983) suggest that the typical computer-based instructional program produced a gain of .5 standard deviations over similar "conventional" instructional programs. In a recent follow-up analysis, Kulik, Kulik, and Bangert-Drowns (1985) note similar results when computer-assisted instruction (CAI) programs are used with elementary learners.

One of the main assumed benefits of CAI as an instructional delievery system lies in its ability to provide individualized instruction through branching options contingent on individual learner progress. The consistent nature and quality of the differentiated feedback and reinforcement found in many well-designed CAI lessons has also been credited with performance and attitude improvement (Clement, 1981).

Since much of the assumed benefit of CAI is often centered around its facility for the delivery of individualized instruction, much of the research on CAI to date has focused on traditional, one learner per machine interactions. However, research in conventional instruction suggests that cooperative, or team learning experiences can often produce improvements in learner performance and attutude.

In addition, it has been suggested that cooperative learning schemes used with appropriately designed CAI assist in the development of social skills, creative thinking, and overall performance. However, whether or not such cooperative learning schemes do indeed improve learner attitude and performance has not been conclusively demonstrated and more research is required.

This paper reports on the findings from a study that compared the performance and attitudes towards instruction of learners working in pairs with learners working individually.

Methods

Subjects

The subjects chosen for partcipation in this study were 60 eighth grade learners selected from two sections of an eighth grade health class. The sample consisted of approximately equal numbers of males and females and was composed primarily of Anglo students, with some minority learners.

Materials

The basic instruction for this study consisted of a 30 minute lesson on the anatomy and physiology of the human male and female reproductive and urinary systems. The lesson

consisted of two major sections, one for each gender. Each section contained instruction on the major organs of the reproductive system and their functions in the reproductive cycle.

Each lesson segment began by describing the size, shape and location of the organ in tutorial form, followed by a computer-generated graphic depicting the organ in the body. Then a brief explanation of the organ's function was given, again in tutorial form. At the end of each such segment, the learners were asked to recall the name of the organ and its function. Two treatment groups were employed as follows.

Individual instruction. In this treatment, learners were assigned to a computer terminal and instructed on the operation of the computer hardware and software. They were then told to complete the lesson individually and report to the teacher when finished.

Team instruction. In this treatment, each learner was randomly assigned a partner with whom to complete the lesson. The learners were then given the operating instruction as in the individual instruction treatment above. The partnerships were then told to complete the lesson by "working together" at the keyboard. At the end of the first half of the instruction, the learners were told to switch positions so that each learner would be entering the team's responses for half of the lesson time.

Dependent Measures

After the completion of their respective treatments, all learners were given two print-based posttests on the anatomy of the human male and female reproductive and urinary systems, as well as an attitude survey designed to assess the learners' attitudes towards the instruction.

Verbal information posttest. The first of these measures consisted of 36 multiple choice items covering both the names and functions of the organs of the reproductive systems. Split-half reliability of this measure was found to be .90 using data from this study.

Visual recall posttest. This test contained 12 items that asked the learner to label line drawings of the reproductive systems. Reliability of this measure was found to be .85 using split-half data obtained during the study.

Attitude survey. In addition to the achievement measures described above, the learners were also given an annonymous print-based twenty-item Likert-type survey designed to assess their attitudes towards the instruction. The split-half reliability coefficient of this instrument was found to be .86.

Procedures

Learners were randomly assigned to their respective treatments where they completed the instruction. Immediately following the lesson, the learners were given the achievement measures and the attitude survey previously described.

Experimental Design Data Analysis

This experiment utilized a completely crossed 2 x 2 Treatment-by-Sex factorial design, featuring two levels each of treatment (team learning and individual learning) and sex (male and female).

Scores on the performance posttests were analyzed through fixed-effects ANCOVA procedures, using sixth grade Comprehensive Test of Basic Skills (CTBS) total scores as the covariate. Attitude data from this study was analyzed with fixed-effects ANOVA procedures.

Results

The results for the verbal information posttest, visual recall posttest, and attitude survey are contained in Table 1. The adjusted means of the individual instruction and the team learning treatment groups were 62.93% and 86.07%, respectively, on the verbal information posttest. These means were significantly different ($p < .001$).

The adjusted means of the individual instruction and team learning group were 55.17% and 74.17%, respectively, for the visual recall

posttest. These means were also significantly different ($p < .001$).

The means of the individual instruction and team learning group were 64.48% and 66.77%, respectively, for the atttude survey. These means were not statistically different ($p > .05$).

Discussion

The most important result from this study was that the team learning treatment scored significantly greater than the individual learning group on both measures of performance. In fact, the effect size of the team learning approach was 1.13 standard deviations for the verbal information posttest and 1.31 standard deviations for the verbal recall posttest and was consistent across both sexes.

This result is easy to interpret when coupled with observations made of the learners as they progressed through their lessons. The pattern of behavior that seemed most typical involved one learner assuming the role of tutor while the other learner became the tutee. In this way, many of the benefits of the Programmed Tutoring system were realized. Specifically, the tutor gained new understanding of the material by verbalizing the materials for his/her partner, while the tutee benefited by his/her peer's explanations.

In addition, there seemed to be an added comfort that came from working together on content that seemed to embarass students working individually. In fact, this comradery was present in both genders.

However, in two of the 15 partnerships, the tutoring relationship degenerated into a competitive, rather than cooperative relationship. In both these cases, the tutor assumed an authoritative role and the tutee rapidly became resentful of his/her peer's demeanor.

No significant differences were yielded on the attitude survey. This result may be attributable to the fact that both treatment groups reacted quite positively to their respective treatments since both treatments represented novel instructional methods.

In summary, the results of this study support research that suggests that tutoring in general, and especially tutoring coupled with CAI, can be an effective mode of instruction, especially for young learners.

However, future research should be conducted on methods in which the CAI lesson itself can maximize the peer tutoring that results from this type of team learning. Perhaps such research efforts may find design approaches which not only maximize learner performance through cooperation, but also minimize the opportunities for unconstructive competition among learning partners.

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Table 1. Mean percent scores for the verbal information, visual recall, and attitude survey.

Treatment	Verbal Info Posttest	Visual Recall Posttest	Attitude Survey
Individual			
male (n = 14)	62.50%	53.94%	65.71%
female (n = 16)	63.32%	56.28%	63.33%
TOTAL (n = 29)	62.93%	55.17%	64.48%
Team Learning			
male (n = 15)	82.61%	73.33%	62.33%
female (n = 16)	89.28%	75.00%	70.94%
TOTAL (n = 31)	86.07%	74.17%	66.77%